



NATIONAL WEATHER  
SERVICE  
DES MOINES IA

- Parkersburg/  
New Hartford  
Tornado
- Lightning  
Safety



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Volume 2, Issue 2

Summer 2008

## Deadly EF5 Tornado Touches Down in North-Central Iowa

Three weeks of severe weather and flooding in Central Iowa got a jump start on the afternoon of May 25<sup>th</sup>. A rare, large and destructive EF-5 Tornado tore up a 41 mile long path across Butler and Black Hawk counties beginning around 448 pm. The initial touchdown occurred near the Butler and Grundy county line, 2 miles south of Aplington. The tornado quickly grew in size and intensity as it approached Parkersburg. The tornado was nearly three quarters of a mile wide as it moved through the southern end of Parkersburg at 459 pm CDT. Devastating structural damage occurred in the town of Parkersburg including nearly 200 homes destroyed. The tornado maintained size and intensity as it move towards New Hartford. At 509 pm CDT the storm moved just north of New Hartford once again causing incredible structural and tree damage. The tornado weakened around 3 miles east of New Hartford with lesser damage as it moved east, just north of the Waterloo and Cedar Falls area. The tornado then grew in size to near 1.2 miles wide north of Dunkerton causing substantial damage to a farmstead there. The tornado lifted just before entering Buchanan County. Significant straight line winds from a large rear flank downdraft (RFD) associated with this massive supercell thunderstorm occurred along and just south of the tornado track with preliminary speed estimates of 90 to 100 mph. At 537 pm, the Waterloo Airport recorded a wind gust of 93 mph.



Figure 1: Courtesy of the Grundy County Sheriff's Department – taken from a patrol car.

This was a sobering day for us here at the National Weather Service (NWS) office in Des Moines. We never want to see weather systems such as this cause such destruction and tragedy. Our hearts and prayers go out to those affected by this disaster.

(Continued on page 2)

## When Thunder Roars, Go Indoors!

**Lightning Safety Information: [www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov)**

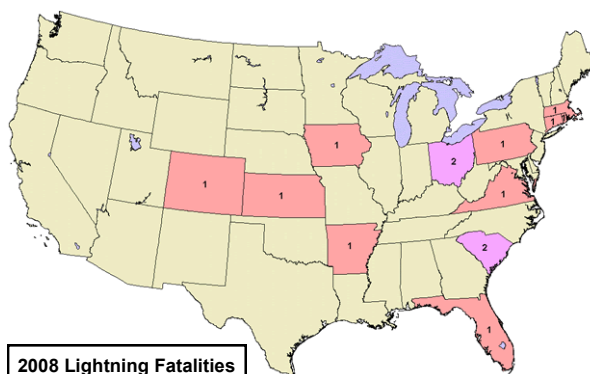


Arthur, IL: Photo Courtesy of R.R. Best

Summer is the peak season for one of the nation's deadliest weather phenomena—lightning. Here in Iowa, the primary lightning season is also in late spring and summer. Lightning is particularly dangerous in Iowa during the summer because of its frequency and more people are outside. On average, lightning kills an average of 62 people annually across the United States making lightning the number 2 killer behind flash flooding.

One Iowan has died so far in 2008 and there have been fourteen deaths nationwide. Over 95 percent of the victims were outside and almost 90 percent were male. This map shows the lightning death distribution across the country so far in 2008.

Lightning is a serious danger. Please visit National Weather Service lightning safety website to learn how to protect you and your family.



2008 Lightning Fatalities

(Continued from page 1)

After significant severe weather events, the local NWS office will send a team of personnel to survey the storm damage to document and make an official determination of the exact cause of damage and intensity of the weather system involved. In the case of the Parkersburg-New Hartford-Dunkerton tornado the NWS spent two whole days surveying the miles and miles of damage. After taking into account the structural integrity of buildings destroyed as well as physical remains of trees, poles, vehicles and other debris, the most intense damage was correlated to wind speeds of up to 205 mph. This classified the tornado as an EF5, the maximum on the Enhanced Fujita Tornado Scale.

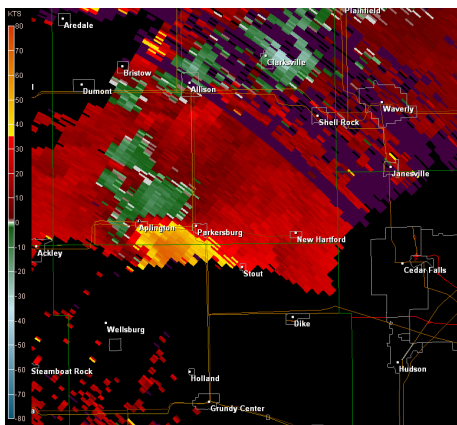
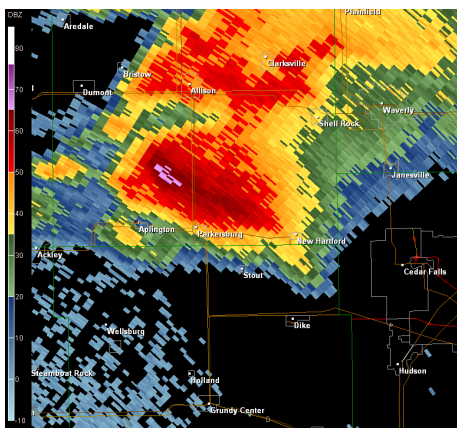
The Enhanced Fujita Tornado Scale classifies tornadoes into the following categories:

EF0...WIND SPEEDS 65 TO 85 MPH.  
 EF1...WIND SPEEDS 86 TO 110 MPH.  
 EF2...WIND SPEEDS 111 TO 135 MPH.  
 EF3...WIND SPEEDS 136 TO 165 MPH.  
 EF4...WIND SPEEDS 166 TO 200 MPH.  
 EF5...WIND SPEEDS GREATER THAN 200 MPH.

### High End Tornado History in Iowa

This is the first EF5 tornado in Iowa since the Jordan tornado of June 13, 1976 which affected Boone and Story counties. Since 1950, Iowa has experienced 6 EF5 tornadoes and 42 EF4s. Only 13 EF4s have occurred since 1980 and there were no EF5s until this event. The last EF4 tornado occurred on April 8, 1999 when two EF4s touched down in portions of southwest and central Iowa. The last tornado path length of at least 41 miles occurred on April 11, 2001 when a tornado tracked 60.5 miles from the Missouri border in Ringgold County to near Paterson in Warren County.

### The View from the National Weather Service in Des Moines



The NWS WSR-88D radar located in Johnston, IA, along with Amateur Radio Operator, trained weather spotter, and storm chaser reports proved to be key in the tornado warning decision-making. Meteorologists at the NWS watched this supercell thunderstorm closely and noted a high likelihood of its ability to produce a tornado. At 422 pm...the first tornado warning was issued for this deadly storm, giving folks in the path at least 26 minutes of lead time before the initial touchdown just south of Aplington at 448 pm. The following is a series of radar images showing the progression of the storm.

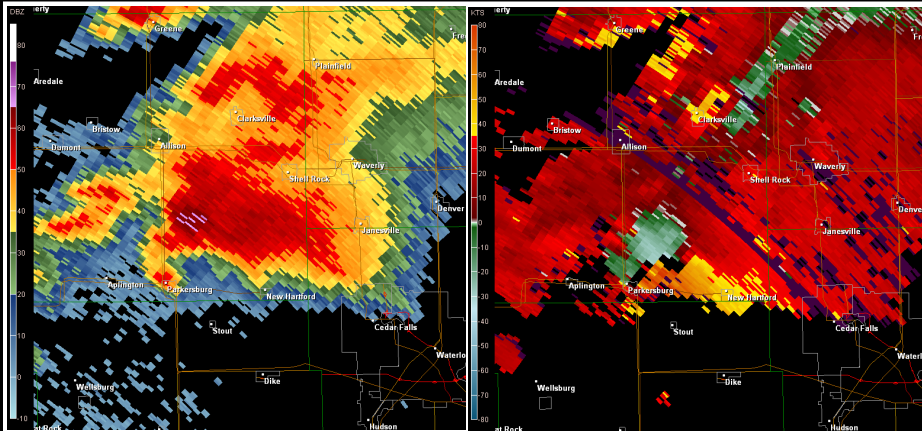
**Figure 3: 4:50 pm:** Base Reflectivity image (Top) and Storm Relative Velocity image (Bottom) from the NWS WSR-88D in Des Moines, two minutes after initial tornado touchdown on the Butler-Grundy county line south of Aplington. Shades of green depict motion toward radar (80 miles to the southwest) whereas reds and oranges depict motion away from the radar.



**Figure 2:** The image depicts the approximate damage path. The width of the green line implies path width, ranging from around 1/2 mile wide in Parkersburg to just over a mile wide northwest of Dunkerton. Tornado path was determined using information provided by Iowa Helicopter.

#### EF5s in Iowa Since 1950

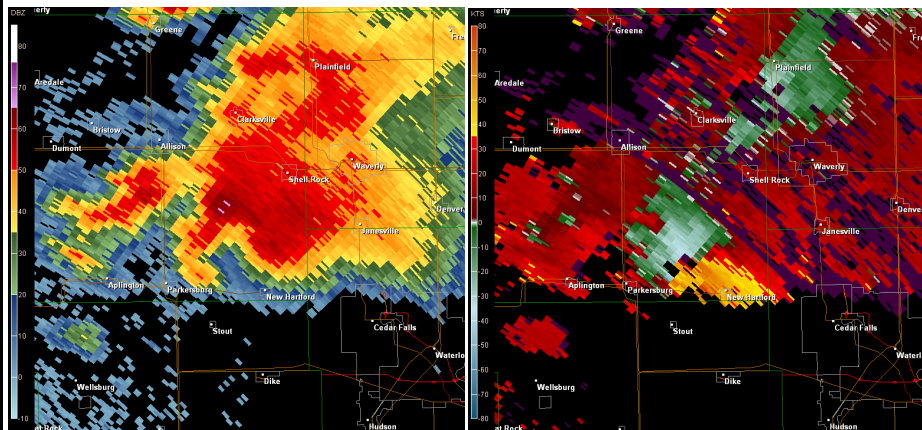
Date	Location	County (s)	Path Length
27 June 1953	Southwest of Adair	Cass, Adair	10 miles
14 October 1966	Belmond	Wright	10 miles
15 May 1968	Charles City	Franklin, Floyd, Chickasaw, Howard	63 miles
15 May 1968	Oelwein	Fayette	13 miles
13 June 1976	Jordan	Boone, Story	21 miles
25 May 2008	Parkersburg-New Hartford	Butler, Black Hawk	41 miles



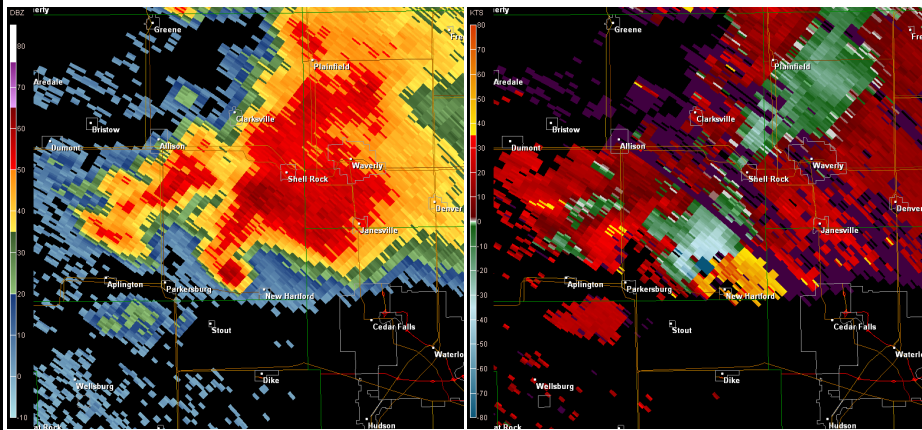
**Figure 4: 4:59 pm:** Base Reflectivity image (L) and Storm Relative Velocity image (R) from the NWS WSR-88D in Des Moines. This is around the time the tornado entered Parkersburg.



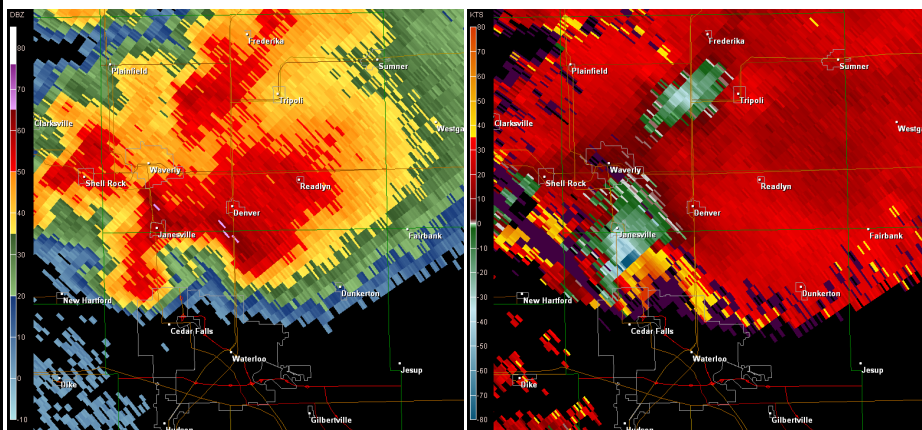
**Figure 5:** Photo of the tornado between Parkersburg and New Hartford around 5:05 pm. Photo taken by NWS Des Moines Senior Meteorologist Rod Donavon (off duty) 1.5 miles south of New Hartford.



**Figure 6: 5:04 pm:** Base Reflectivity image (L) and Storm Relative Velocity image (R) from the NWS WSR-88D in Des Moines. The tornado has exited Parkersburg and is heading toward New Hartford. In this case, the tornado is near or just above the "g" in Parkersburg. This is near the time of the tornado photo in Figure 5.



**Figure 7: 5:08 pm:** Base Reflectivity image (L) and Storm Relative Velocity image (R) from the NWS WSR-88D in Des Moines. Shortly after this time, the tornado causes damage in New Hartford.



**Figure 8: 5:26 pm:** Base Reflectivity image (L) and Storm Relative Velocity image (R) from the NWS WSR-88D in Des Moines. The tornado continues to move east, just north of Cedar Falls or even right in the northern edge of the town. Shortly after this time, at 5:35 pm., a 93 mph wind gust was recorded at the Waterloo Airport which is in the extreme northwest part of Waterloo.

## Flood 2008 Affects NOAA Weather Radio Transmitter in Marshalltown *by David Reese,*

*Electronics Systems Analyst*

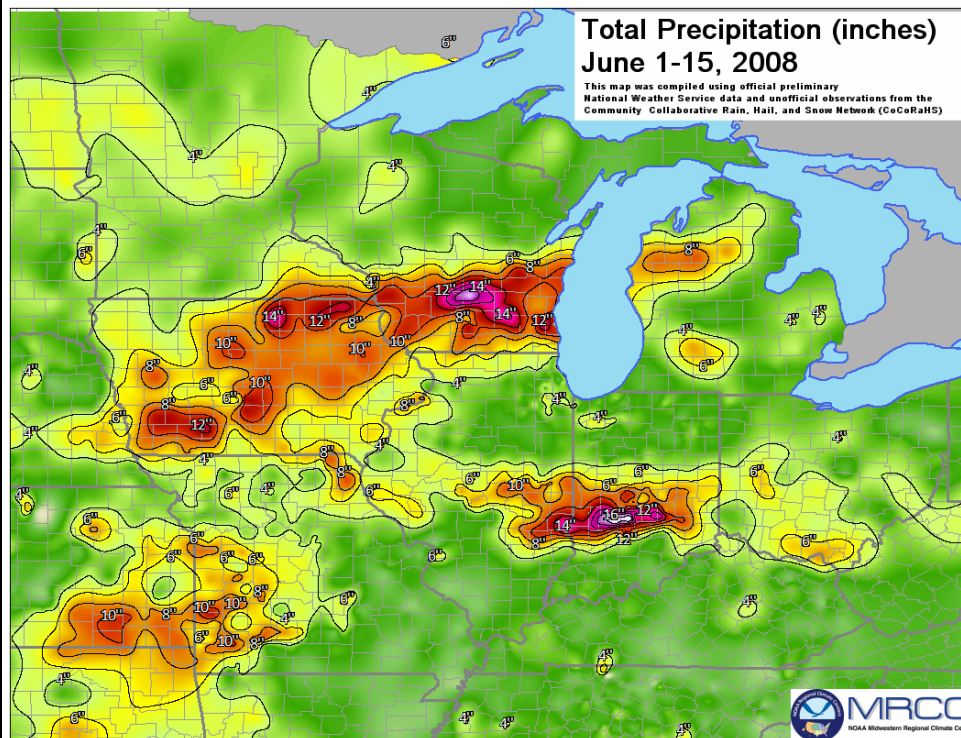
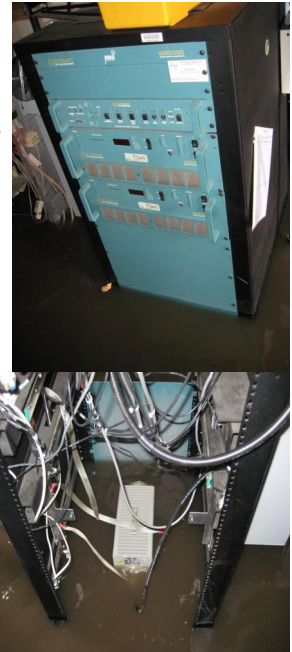


Due to the flood at Marshalltown, the NOAA Weather Radio (NWR) transmitter at Alliant Energy had to be shut down and most of the equipment removed. After a report from Alliant Energy on June 9<sup>th</sup>, that the flood waters were about to enter the site where the NWR transmitter was located, our own Electronic Systems Analyst, David Reese, and a meteorologist, Ken Podrazik surveyed the site. Upon their arrival, they found about 8-10 inches of water in the building, and power had already been shut off. In order to prevent water damage, David and Ken worked quickly to remove as much of the main transmitter equipment from the cabinet as possible. However, the cabinet was bolted to the floor and could not be removed. The wiring that could not be removed was tied up in the cabinet as high as possible to prevent water damage. The National Weather Service (NWS) in Des Moines was able to move the Marshalltown NWR products over to neighboring NWR transmitters hoping that the residents would be able to receive them, and advertised the frequencies to the public.

The National Weather Service Central Region Headquarters (CRH) was notified of the transmitter shutdown, and of the lack of service to the people of Marshalltown, and took action to find a temporary location, and transmitter to install in Marshalltown.

RACOM Critical Communications, a wireless telecommunications company in Marshalltown, volunteered to temporarily provide the tower, antenna, cable, and space for the NWR Crown Transmitter. NWS CRH sent Howard Pigors, Regional Maintenance Specialist for the NWR program, to pick up a new Crown transmitter from the factory, and then transport it to RACOM Critical Communications during the week of June 16<sup>th</sup>. The Electronics staff from WFO Des Moines, David Reese, Darren Gregory, and Drew Bouvette, assisted Howard with the installation of the new transmitter at RACOM. The new transmitter became completely operational during that week and remained on the air until the permanent transmitter site was restored to full operation in early July.

The NWS appreciates the extra efforts on the part of their partner, RACOM Critical Communications, to go the extra mile during this emergency, and to ensure that the Marshalltown NWR listening area would receive service.



**Fun Fact:** Several Daily Maximum Rainfall Records set at Waterloo.

- ◆ 0.83 inches on 07/12/2008 broke the old record of 0.78 inches set in 1987.
- ◆ 1.90 inches on 06/08/2008 broke the old record of 1.50 inches set in 1963.
- ◆ 3.05 inches on 04/25/2008 broke the old record of 1.30 inches set in 1953.
- ◆ 2.29 inches on 04/18/2008 broke the old record of 1.79 inches set in 1909.

## 2008 Cooperative Observer Length of Service Awards

The Cooperative Observer Program is a great asset to the National Weather Service across the country. The observer duties include gathering daily maximum and minimum temperature, 24-hour liquid equivalent and snowfall totals, snow depth, soil temperatures, and river/creek levels. Each year, the National Weather Service presents



**New Hartford Observer Paul Fobian: 30 Years of Service Award**

awards to the outstanding individuals who volunteer their time to partake in a nationwide climate database. This year, the Des Moines National Weather Service will be presenting several Length of Service Awards to the respective Cooperative Observers. The awards are given every 5 years beginning after the first 10 years of service. The Des Moines National Weather Service would like to take the time to say thank you for the extended years of service and commitment to the program.



**Humboldt Observers Dale and Peg Behrens: 10 Years of Service Award**



**Kanawha Observer David Rueber: 20 Years of Service Award**



**Brooklyn Observer Craig Hall: 10 Years of Service Award**



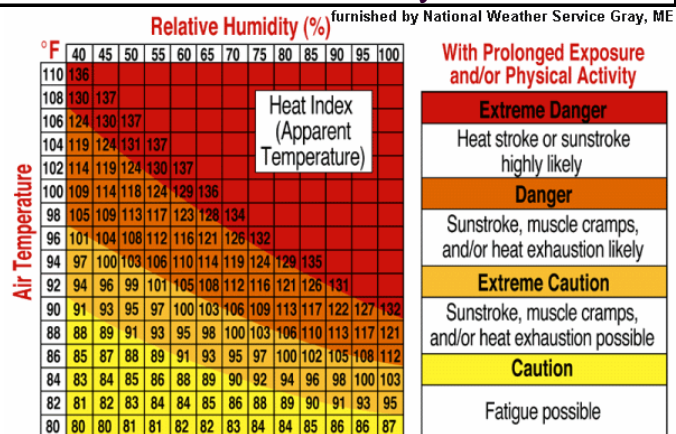
**Jewell Observer Stan Boggs: 15 Years of Service Award**

## Summertime in Iowa Often Means Heat and Humidity

Summertime in Iowa means two things: heat and humidity. These two weather parameters combine to create the Heat Index (Apparent Temperature), which is an accurate measure of how hot it really feels when relative humidity is combined with the actual air temperature. The combination of extreme heat and humidity conspire to tax the human body beyond its natural cooling abilities.

Some safety tips during heat waves:

- Drink plenty of non-alcoholic fluids.
- Spend more time indoors
- Check frequently on the elderly, youth and pets
- Stay in air conditioned areas
- Avoid exercise during the heat of the day



## New Fire Weather Product by Frank Boksa, General Forecaster

The National Weather Service in Des Moines has expanded the Fire Weather program for central Iowa. Beginning last April, a Fire Weather Planning Forecast was added to our suite of Fire Weather products. This forecast product is a seasonal product that is issued once daily between the months of April and October. The purpose of the forecast product is to give those who must plan a prescribed burn a method to plan for their burns as far out as 7 days. The product is designed to give a forecast of specific burn parameters such as transport wind, relative humidity and smoke dispersion, out to 48 hours. Beyond 48 hours through 7 days, a temperature, wind and precipitation forecast is given.

Feedback on this product thus far has been favorable. A more formal survey and evaluation of the new Fire Weather Planning Forecast will be conducted this fall. You can see the Fire Weather Planning Forecast for your county by going to: [www.weather.gov/dmx](http://www.weather.gov/dmx) then clicking on the Fire Weather link on the left side of the page under "Forecasts". Once you are at this page simply click on your county and the Fire Weather Planning Forecast will appear.

## Outlook for the Rest of the Summer and Early Fall *by Miles Schumacher, Senior Forecaster*

It has certainly been a wet spring and early summer thus far. In fact, temperatures have basically been below normal since December. A quick look back into the record books shows there have only been 4 other years in which this has occurred in central Iowa. They were 1884-85, 1903-04, 1977-78, and 1978-79. Very heavy rain was a chronic problem this spring with many areas of the state having already received 20 to over 30 inches of rainfall thus far for the year.

One of the causes of the large amount of severe weather is the jet stream. It has tracked farther south than usual for this time of the year, and the presence of an upper level trough in the western U.S. has been a dominant upper air feature through the spring. In part, this can be traced to the slow breakdown of La Niña over the past several months. Quite typically, this will lead to a southward shift of the jet stream.

In contrast to the large area of cool water along much of the equatorial Pacific that we saw in the early winter, the La Niña has weakened considerably in the past few months. See Figure 1.

BMRC/NMC Global SST Anomaly  
Week Ending 15 Jun 2008

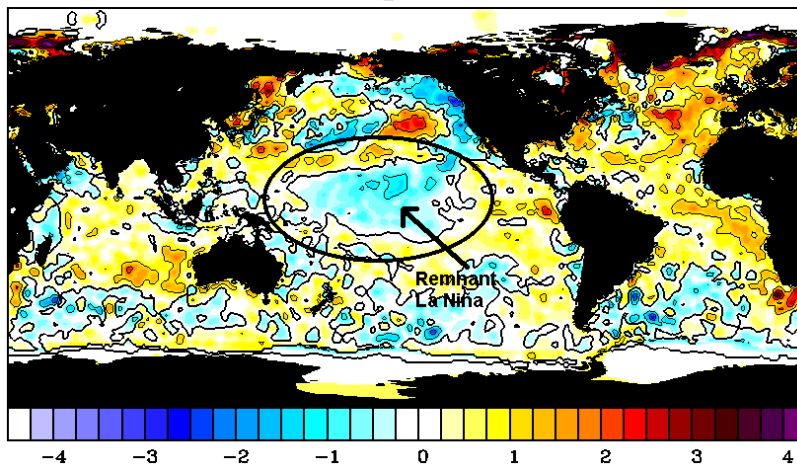


Figure 1: Sea Surface temperatures departure from normal.

Notice that the pool of cool water is still there, however it is not as cold, relative to normal, as it was just a few months ago. In addition (not shown) is the fact that the water temperatures below 100 meters in depth are all well above normal. This would tend to indicate that the balance of the summer into the fall will likely see neutral conditions across the equatorial Pacific - in other words, neither La Niña nor El Niño.

What does this mean for the summer? Typically, the second summer of La Niña conditions tends to be hot and dry. With La Niña breaking down though, it is not likely that this pattern will verify this summer.

Given the antecedent wet soil conditions, the chances of July turning out to be a hot month are relatively low. For Iowa, it is likely that July will average a little cooler than normal, though the sub-tropical ridge is likely to begin to influence the south by mid month. See Figure 2.

Rainfall for July is likely to be a little above normal; however it does not appear that Iowa will experience the extremes seen in June. The jet stream will shift farther north during the month, which will tend to steer more of the heavy rainfall to the north of Iowa. As the upper air ridge becomes more dominant in the Rockies, Iowa will be in a northwest flow. The best chance for above normal rainfall will be over the northeast. See Figure 3.

Moving into August, it does appear that there will be some influence from the weak La Niña type pattern still present in the Pacific. It is likely that the sub-tropical ridge will become stronger in August, resulting in a warmer than normal August for most of the state. See Figure 4.

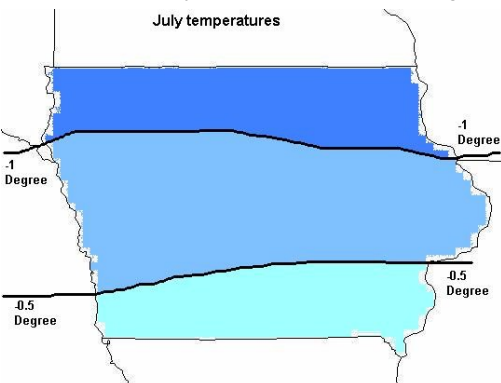


Figure 2: Forecast temperature departure for July.

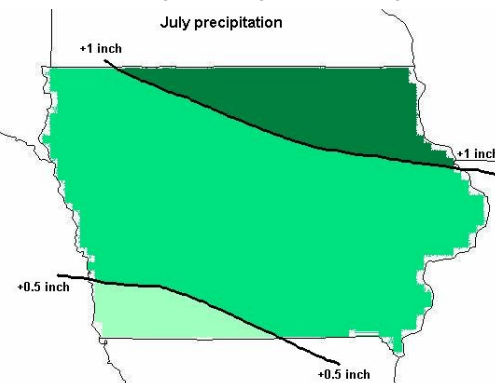


Figure 3: Forecast precipitation departure for July.

It is likely that precipitation will return to near normal across northern Iowa, and fall short of normal across the south. The majority of the strongest thunderstorm activity is expected to shift north of Iowa, while some of the activity may brush the northern Iowa counties. See Figure 5.

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(Continued from page 6)

A quick look into the fall suggests that a warmer and drier pattern is likely to prevail through at least the first half of the season - through mid October. There is plenty of uncertainty since the state of the equatorial Pacific Ocean is in a state of change.

These outlooks are based more heavily on statistics than many of the methods used by the [Climate Prediction Center](http://www.cpc.ncep.noaa.gov/) (<http://www.cpc.ncep.noaa.gov/>). The complete set of official forecasts from the Climate Prediction Center can be found on our [website](http://www.weather.gov/climate/climate_prediction.php?wfo=dmx) ([http://www.weather.gov/climate/climate\\_prediction.php?wfo=dmx](http://www.weather.gov/climate/climate_prediction.php?wfo=dmx)).

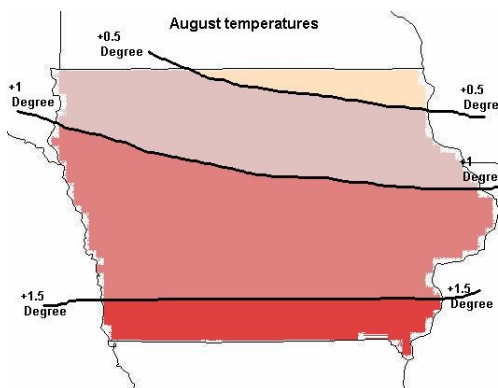


Figure 4: Forecast temperature departure for August.

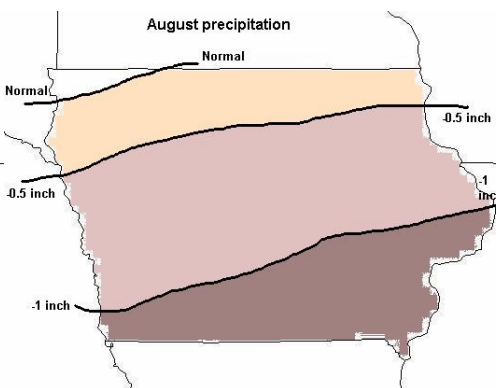


Figure 5: Forecast precipitation departure for August.

**Fun Fact:** Daily Maximum Rainfall Records set/tied at Des Moines.

- 1.43 inches on 06/26/2008 tied the previous record set in 1937.
- 4.15 inches on 06/05/2008 broke the old record of 2.13 inches set in 1931.

#### Climatological Data for March to June 2008

Location	Month	Average Temp	Departure	Highest	Lowest	Rain / Snow	Departure
Des Moines	Mar	35.6°	-2.8°	63° (2 <sup>nd</sup> )	0° (8 <sup>th</sup> )	1.61" / 4.8"	-0.60" / +0.7"
	Apr	47.9°	-2.7°	77° (16 <sup>th</sup> , 23 <sup>rd</sup> )	26° (9 <sup>th</sup> )	5.82" / 1.1"	+2.24" / -1.6"
	May	60.4°	-1.0°	87° (25 <sup>th</sup> )	36° (4 <sup>th</sup> )	3.84" / 0.0"	-0.41" / 0.0"
	June	71.4°	0.0°	88° (7 <sup>th</sup> , 25 <sup>th</sup> )	54° (17 <sup>th</sup> )	13.42" / 0.0"	+8.85" / 0.0"
Mason City	Mar	28.5°	-4.4°	51° (26 <sup>th</sup> , 13 <sup>th</sup> )	-8° (8 <sup>th</sup> )	1.81" / 4.4"	-0.43" / -1.7"
	Apr	43.5°	-2.9°	76° (23 <sup>rd</sup> )	20° (2 <sup>nd</sup> )	4.96" / 0.5"	+1.60" / -2.2"
	May	56.0°	-3.0°	85° (25 <sup>th</sup> )	32° (12 <sup>th</sup> )	5.21" / 0.0"	+0.87" / 0.0"
	June	67.7°	-1.0°	90° (7 <sup>th</sup> )	47° (17 <sup>th</sup> )	10.84" / 0.0"	+5.88" / 0.0"
Waterloo	Mar	30.0°	-5.0°	53° (26 <sup>th</sup> )	-6° (8 <sup>th</sup> )	1.61" / 5.1"	-0.52" / +0.3"
	Apr	45.3°	-2.5°	78° (21 <sup>st</sup> )	19° (2 <sup>nd</sup> )	10.79" / T	+7.56" / -2.2"
	May	56.8°	-3.4°	82° (6 <sup>th</sup> )	33° (12 <sup>th</sup> )	6.25" / 0.0"	+2.10" / 0.0"
	June	69.6°	-0.3°	90° (7 <sup>th</sup> )	49° (17 <sup>th</sup> )	8.77" / 0.0"	+3.95" / 0.0"
Ottumwa	Mar	36.5°	-3.1°	70° (31 <sup>st</sup> )	3° (8 <sup>th</sup> )	1.97" / M	-0.38" / M
	Apr	48.5°	-3.1°	77° (23 <sup>rd</sup> , 21 <sup>st</sup> )	26° (14 <sup>th</sup> )	6.10" / M	+2.82" / M
	May	58.8°	-4.1°	82° (31 <sup>st</sup> , 17 <sup>th</sup> )	34° (4 <sup>th</sup> )	4.93" / M	+0.37" / M
	June	70.5°	-2.0°	87° (25 <sup>st</sup> , 7 <sup>th</sup> )	50° (17 <sup>th</sup> )	9.86" / M	+5.35" / M

## Improved Warning Service: New Super Resolution Radar Data and Storm Based Warnings *by Rich Kinney, General Forecaster*

As of May 13th, 2008, improved Radar Data is available to meteorologists at the National Weather Service in Des Moines. Warning meteorologists use three basic types of radar data to analyze storms and issue warnings:

**Reflectivity:** Energy sent from the radar strikes a storm and is “reflected” back to the radar. The resulting images (see figures 1 and 2) enable meteorologists to determine the storm size, structure, and movement.

**Velocity:** Doppler technology allows for the detection of motion in storms toward and away from the radar. Shades of red (wind moving away from the radar) and green (wind moving toward the radar) are displayed, and help meteorologists detect strong straight line winds, rotation in storms, and other features such as small scale fronts.

**Spectrum Width:** The radar measures the variability in velocity data. The resulting images help meteorologists identify regions of wind shear and large hail in storms.

The upgrade, termed “Super Resolution,” provides up to 8 times better spatial resolution, enabling better detection of small-scale features such as hook echoes and rotating storms. Super Resolution capability will be particularly important for smaller tornadoes, and for all tornadoes that occur at longer ranges from radars. The Super Resolution capability increases reflectivity range resolution four-fold; and increases the radar reflectivity, velocity and spectrum width resolution two-fold. In addition, the reflectivity, velocity and spectrum width data range is extended, which enhances detection of distant severe storms.

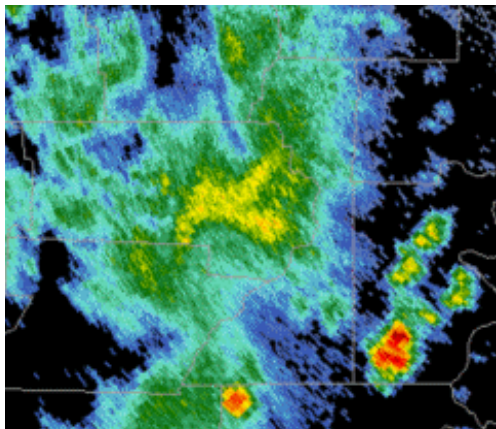


Figure 1: New Super Resolution Reflectivity

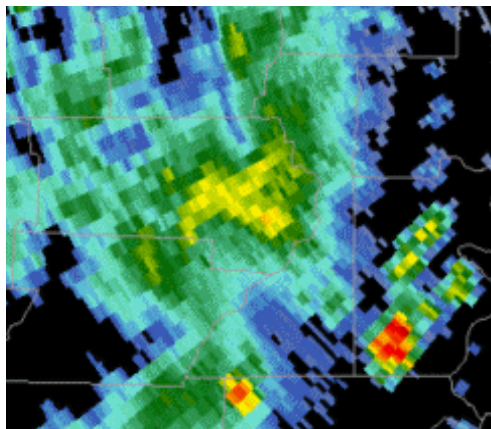


Figure 2: Old Reflectivity Resolution

Super Resolution data should lead to increased tornado warning lead times. Simulations using Super Resolution data show that rotating thunderstorms and tornado signatures can be detected at greater ranges than with old resolution data. In addition, other smaller scale features should be detectable sooner or with greater reliability.

The NWS previously issued and disseminated warnings for tornado, severe thunderstorm,

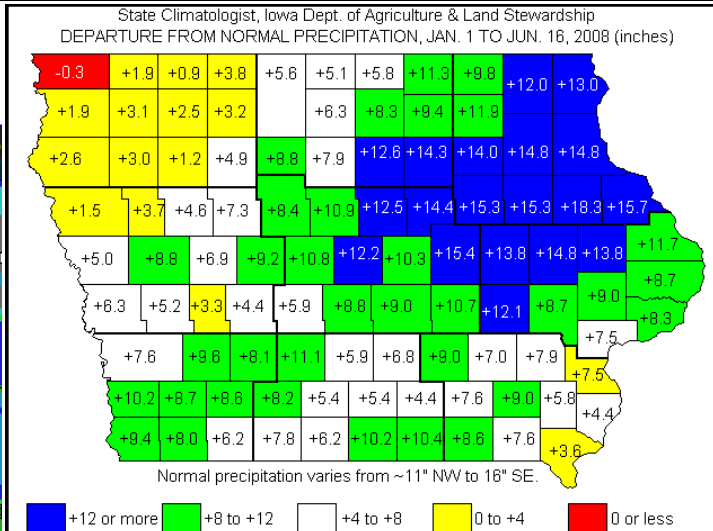
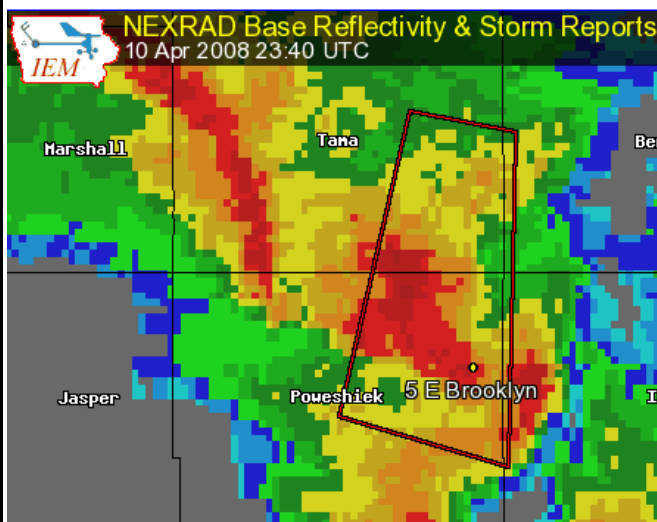
flood and marine hazards using geopolitical boundaries, i.e. counties. Realizing the continuing need to improve the specificity and accuracy of warnings, the NWS now issues **Storm-Based Warnings** (as of October 1, 2007). **Storm-Based Warnings** show the specific meteorological or hydrological threat area and are not restricted to geopolitical boundaries. (See Figure 3 on Page 9)

- Focuses spotter and first responder resources on the true area threatened by a given storm
- Easily handles storms moving along county borders
- Allows emergency managers to determine what tornado warning sirens to sound
- Limits the area covered by a warning to the actual area under threat (in time and space)
- Minimizes the impact on residents outside the threat area

A 2005 study showed a 73 percent reduction in total area warned, and a 70 percent reduction in total number of towns warned, using storm-based vs. county-based warnings. **Storm-Based Warnings** will promote improved graphical warning displays, and in partnership with the private sector, support a wider warning distribution through cell phone alerts, pagers, web-enabled Personal Data Assistants (PDA), etc. NOAA Weather Radios will work as before and continue to alert entire counties.

**Storm-Based Warnings  
pinpoint the threat area  
and reduce false alarms**

**Figure 3: Tornado Warning** for portions of Tama and Poweshiek Counties on 10 April 2008 (courtesy Iowa Environmental Mesonet)



The map of Iowa above shows the departure from normal precipitation through June 16, 2008 by county.

## June 2008 Record or Major River Crests in Central Iowa

The preliminary record crests from this year are highlighted in **yellow**

Gage Location	Water Body	Flood Stage	Record Stage	Date	2008 Crests (Preliminary)	Date
New Hartford (NHR14)	Beaver Creek	10 FT	13.50 FT	06/13/1947	15.43 FT	06/09/2008
Webster City (WBC14)	Boone River	12 FT	19.10 FT	06/10/1918	17.74 FT	06/10/2008
Janesville (JAN14)	Cedar River	11 FT	17.15 FT	07/22/1999	19.68 FT	06/08/2008
Waterloo (ALO14)	Cedar River	12 FT	21.86 FT	03/29/1961	25.39 FT	06/11/2008
Cedar Falls (CED14)	Cedar River	88 FT	96.20 FT	07/23/1999	102.13 FT	06/11/2008
Fort Dodge (FOD14)	Des Moines River	10 FT	19.62 FT	06/23/1947	15.73 FT	06/08/2008
Saylorville Reservoir (SAY14)	Des Moines River	NA	892.03 FT	07/11/1993	890.87 FT	06/12/2008
Below Saylorville Reservoir	Des Moines River	NA	24.12 FT	07/11/1993	23.81 FT	06/13/2008
Des Moines Southeast 6 <sup>th</sup> Street (DES14)	Des Moines River	24 FT	34.29 FT	07/11/1993	35.27 FT	06/13/2008
Des Moines 2 <sup>nd</sup> Avenue (DMO14)	Des Moines River	23 FT	31.71 FT	07/11/1993	31.57 FT	06/13/2008
Ottumwa (OTM14)	Des Moines River	10 FT	22.15 FT	07/12/1993	20.59 FT	06/17/2008
Stratford (STR14)	Des Moines River	14 FT	25.68 FT	04/02/1993	27.32 FT	06/09/2008
Tracy (TRC14)	Des Moines River	14 FT	26.50 FT	06/14/1947	23.70 FT	06/14/2008
Marshalltown (MIW14)	Iowa River	18 FT	20.77 FT	08/17/1993	21.79 FT	06/13/2008
Indianola (IDN14)	Middle River	19 FT	26.90 FT	06/05/1947	25.55 FT	06/06/2008
Perry (PRO14)	North Fork Raccoon River	15 FT	23.00 FT	07/10/1993	21.67 FT	06/10/2008
Van Meter (VNM14)	Raccoon River	16 FT	26.34 FT	07/10/1993	22.67 FT	06/13/2008
Des Moines Fleur Drive (DEM14)	Raccoon River	12 FT	26.70 FT	07/11/1993	24.66 FT	06/13/2008
Des Moines Highway 28 (DMW14)	Raccoon River	32 FT	43.00 FT	07/11/1993	41.31 FT	06/13/2008
Shell Rock (SHR14)	Shell Rock River	12 FT	17.70 FT	04/01/1856	20.00 FT	06/10/2008
Ames 3 Miles North (AME14)	South Skunk River	14 FT	15.87 FT	06/17/1996	16.93 FT	06/09/2008
Oskaloosa (OOA14)	South Skunk River	17 FT	25.80 FT	05/01/1944	24.60 FT	06/13/2008
Finchford (FNH14)	West Fork Cedar River	12 FT	18.45 FT	07/29/1990	20.82 FT	06/10/2008
Mason City (MCW14)	Winnebago River	7 FT	15.70 FT	03/30/1933	18.74 FT	06/09/2008

**NATIONAL  
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Central Iowa  
The Weather Whisper

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